

CLAIMS

1. A method of cooling a charge-coupled device; said method comprising:
coupling said charge-coupled device to a cold side of a thermoelectric cooling device;
5 coupling a hot side of said thermoelectric cooling device to a transfer plate;
mounting said transfer plate to a thermal barrier; and
coupling said transfer plate to a heat sink.
2. The method of claim 1 further comprising interposing a spacer between said charge-coupled device and said cold side of said thermoelectric cooling device.
- 10 3. The method of claim 2 wherein said interposing comprises selectively dimensioning said spacer to maximize a surface area of contact between said charge-coupled device and said cold side of said thermoelectric cooling device.
4. The method of claim 2 wherein said interposing comprises selectively dimensioning said spacer to position said hot side of said thermoelectric cooling
15 device in a predetermined location relative to said charge-coupled device.
5. The method of claim 1 further comprising selectively applying a conformal coating to at least one of said transfer plate, said thermal barrier, and an interface between said transfer plate and said thermal barrier.
6. The method of claim 5 wherein said selectively applying comprises providing
20 an environmentally tight moisture barrier with said conformal coating.
7. The method of claim 1 further comprising cooling said hot side of said thermoelectric cooling device.
8. The method of claim 7 wherein said cooling comprises transferring heat generated by said thermoelectric cooling device from said charge-coupled device.
- 25 9. The method of claim 1 wherein said mounting comprises attaching said transfer plate to an epoxy laminate material.
10. The method of claim 1 wherein said mounting comprises isolating heat generated by said thermoelectric cooling device from said charge-coupled device.
11. An apparatus comprising:
30 a charge-coupled device mounted in a housing;

- a thermoelectric cooling device having a cold side and a hot side; said cold side coupled to said charge-coupled device;
- a heat sink; and
- a transfer plate coupling said hot side of said thermoelectric cooling device to said heat sink in a heat transfer relationship; said transfer plate mounted to a thermal barrier operative to prevent heat transfer between said thermoelectric cooling device and said housing.
12. The apparatus of claim 11 further comprising a spacer interposed between said charge-coupled device and said cold side of said thermoelectric cooling device.
- 10 13. The apparatus of claim 12 wherein said spacer is selectively dimensioned to maximize a surface area of contact between said charge-coupled device and said cold side of said thermoelectric cooling device.
14. The apparatus of claim 12 wherein said spacer is selectively dimensioned to position said hot side of said thermoelectric cooling device in a predetermined
- 15 location relative to said charge-coupled device.
15. The apparatus of claim 11 further comprising a conformal coating applied to at least one of said transfer plate, said thermal barrier, and an interface between said transfer plate and said thermal barrier.
16. The apparatus of claim 15 wherein said conformal coating provides an
- 20 environmentally tight moisture barrier.
17. The apparatus of claim 11 wherein said thermoelectric cooling device is a Peltier cooling device.
18. The apparatus of claim 11 wherein said transfer plate is constructed of a heat-conducting metal.
- 25 19. The apparatus of claim 11 wherein said thermal barrier is constructed of an epoxy laminate material.
20. The apparatus of claim 12 wherein said spacer is constructed of a heat-conducting metal.